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ABSTRACT

This publication contains an annotated bibliography of materials (books, articles, reviews and others), published and unpublished, that make a contribution to the expanding literature on graduate education. The content of the document includes only those materials collected between August 15, 1972 and December 31, 1972. The citations are presented under the headings of history and development, structure and function, instruction and research, manpower, costs and financing, and recommendations. An author index is also included. (HS)

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AN ANNOTATED INTEROFFICE BIBLIOGRAPHY ON GRADUATE EDUCATION

Part III

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
OFFICE OF EDUCATION
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December 31, 1972

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PREFACE

This publication is the third in a series of Interoffice Annotated Bibliographies developed for use in the Office of the Chairman and that of the Staff Director of the National Board on Graduate Education. The purpose of the bibliographies is to compile concisely annotated references of those materials (books, articles, reviews, and others), published and unpublished, which make a contribution to the expanding literature on graduate education and which continually arrive at the offices of National Board on Graduate Education. With each annotation, we have attempted to treat the author's intent and method, the major areas discussed, and the pertinent conclusions reached.

The content of part III includes only those documents sent to us or brought to our attention between August 15, 1972 and December 31, 1972. Part I in the series included materials received between February 1, 1972 and April 30, 1972. Part II included materials received between April 30, 1972 and August 15, 1972.

The organization and categories used here follow those employed in the two bibliographies prepared by Wayne C. Hall: 1) Annotated Bibliography on Graduate Education: 1950-1971; and 2) An Annotated Bibliography on Graduate Education, 1971-1972. The former was prepared under the aegis of the Office of Scientific Personnel of the National Research Council and published by the National Board on Graduate Education. The 1971-72 bibliography was commissioned by the National Board on Graduate Education.

While this Interoffice Bibliography on Graduate Education serves primarily as a working document for the offices and members of the National Board, it may serve others concerned with the study of present issues and the future of graduate education.

Edward L. Allen
Staff Associate
Champaign, Illinois
December, 1972

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HISTORY AND DEVELOPMENT

COLLEGES AND UNIVERSITIES

-- Toombs, William

"Reluctant Courtship: Community College and Graduate School"

Educational Record, Vol. 53 (Summer, 1972), 222-226.

The author begins by noting that among the most significant developments in the decade of the sixties, characterized by the unusual speed and scope of growth within the educational field, no development was more remarkable than the incorporation of the two-year college into the life of all 50 states. In his view, this major development was all the more striking because it took place in an atmosphere of indifference on the part of graduate schools in the major universities.

He examines two persisting questions related to the development of the junior college movement and the lack of attention given that movement by the graduate schools: 1) Why has there been so little liaison between graduate schools and two-year colleges, two segments of the educational enterprise both so successful in their own way? and 2) What is the prospect for change? He suggests that the problem between the community colleges and the universities is relational rather than one of content of knowledge. The lack of liaison stems, at least in part, from the fact that graduate schools and community colleges have simply been oriented in different directions.

Toombs also describes a seminar on community college personnel conducted at Pennsylvania State University between presidents or representatives of two-year institutions and deans from a number of colleges in the university. At that conference several recurring themes highlighted the principal issues and some of the directions for their resolution as the community colleges and graduate schools work toward a meaningful relationship.

STRUCTURE AND FUNCTION

ADMISSIONS

-- Shoemer, James R., Thomas, James R., and Bragonier, Wendell H.

A Study of the Effect of Non-traditional Grades on Admission to Graduate School and the Awarding of Financial Aid

Fort Collins, Colorado: Colorado State University, 1972. (Mimeographed)

In addition to seeking information about the effect of non-traditional grades on admission to graduate school and chances for financial assistance such as fellowships, assistantships, and grants, this study sought information concerning the manner in which non-traditional grades are used by graduate schools and the various attitudes of graduate deans concerning non-traditional grading.

In general, the data indicated that moderate percentages on non-traditional grades (less than 10 percent) have little hinderance on a student's chances for admission to graduate school. Although the effect is somewhat more pronounced, moderate numbers of non-traditional grades also do not have a serious effect on one's chances for admission and financial support. However, when a student's records indicate 10 percent or more non-traditional grades, his chances for admission and financial support become jeopardized. No significant differences were found between public and private institutions, nor were significant differences found between graduate schools of difference sizes.

Further, the authors found that graduate schools vary considerably in the manner in which they use non-traditional grades in arriving at admissions decisions. Some examples are provided. They also found that most graduate deans have negative feelings about non-traditional grading. They conclude that while deans of graduate schools are uneasy about non-traditional grades, they do accept moderate numbers of non-traditional grades without penalizing applicants.

INSTRUCTION AND RESEARCH

PROGRAMS

-- Cottrell, T. L.

"Problems Facing Research in the Natural Sciences"

CRE-Information, No. 19 (July, 1972), 3-11.

The author (Vice Chancellor, University of Stirling, England) discusses the prospects for the future of higher education for the Standing Conference of Rectors and Vice Chancellors of the European Universities. Beginning with the premise that current social demands for growth in higher education is a reflection of an optimistic view held by potential students and their parents that a university degree is a passport to a materially successful career, he examines the thesis that whatever the real social needs are that lie behind the demands for more higher education, they are not for more Ph.D.s with specialist experience in some branch of fundamental research in the natural sciences. Given the fact that future prospects seem clear and depressing because of the likely increase in students, less money for research, and fewer research students, Cottrell asks whether the prospect is really as clear and depressing as this and if so, what can be done to make it less depressing.

-- Dressel, Paul L.

"Graduate Programs: Experiments with Off-campus Learning"

Journal of Higher Education, Vol. XLIII (October, 1972), 525-530.

The author argues that the time is ripe for a return to emphasis on accomplishment rather than on time serving for graduate degrees. In his view, the major obstacle to taking such a step is the fact that we have moved to mass production which emphasizes credit accumulation without a clear conception of what insights, abilities, or accomplishments are the earmark of a graduate degree. Consequently, any attempt to recognize off-campus learning by granting degrees will be beset with problems in definition of standards of accomplishment. The establishment of off-campus graduate programs necessitates defining in detail the requirements and standards for a sound degree. Dressel identifies three distinctive indices for determining whether a program is truly at the doctoral level. First, if the originial definition of expected accomplishments is not acceptable to competent judges of graduate education, then the program is inappropriate. Secondly, if the experiences planned are not sufficiently related to the goals and do not require and insure some continuing development of scholarship, the program is ineffective.

Thirdly, if there is not an adequate evaluation program conducted during and at the conclusion of the program to ascertain that the individual has indeed attained the standards and fulfilled the obligations initially described, then the program is inadequate.

-- Eble, Kenneth E.

"The Road to College Teaching Must Be Rebuilt or Repaired"

Chronicle of Higher Education, (Nov. 6, 1972), 6.

Mr. Eble reports on his experiences at a recent conference on "New Perspectives in Graduate Education, " sponsored by the Wright Institute in Berkeley and led by Nevitt Sanford. He focuses his discussion on the preparation of teachers in graduate schools. He argues that efforts aimed at improving preparation of future college teachers in the graduate schools are increasing and will probably pay high dividends.

While he does not wish to imply that course work is the answer to better preparing college teachers, Eble feels that such courses at least indicate a genuine interest in the teaching aspect of a graduate student's career. He refers to several programs around the country which he feels have been fairly successful and ends by suggesting that a more positive approach to teaching is one of the important changes that may be coming into graduate education.

-- Elton, Charles F. and Rose, Harriett A.

"What Are the Ratings Rating?"

American Psychologist, Vol. 27 (March, 1972), 197-201.

The authors argue in this article that the institutional ratings of psychology departments appearing the the Cartter study on departmental ratings in various fields of study at the graduate level can be predicted by the use of simple data in the public domain which incorporate variables related to size. Two of the most salient implications they draw from their study are that: 1) the confusion between measures of quantity and quality is highlighted. They point out that while quantity and quality need not be mutually exclusive, it may be unwise for psychologists to conclude that where quantity exists, there also resides quality; and 2) there is a necessity to develop criteria against which to measure departmental quality. They suggest that departments presumably have neglected to address themselves to this problem because of the easy availability of size data, and that among the probable reasons for the absence of measures of departmental quality is the failure of departments to clarify their own goals.

They note that two contrary themes appear in the literature: one favors the quantitative emphasis expressed by the rating games, and the other seeks to define appropriate instructional objectives for the discipline of psychology.

-- National Science Foundation

Research and Development in Industry, 1970

Washington, D.C.: National Science Foundation (NSF 72-309).

This report is based on the National Science Foundation's survey of industrial research and development in 1970. It contains statistics on industrial research and development performance by source of financing, character of work, and geographic distribution. The report also includes basic research data presented by field of science. Applied research and development are shown by product field. Finally, the report includes data on full-time-equivalent numbers of research scientists and engineers as of January 1971.

MANPOWER

-- Ahamad, Bashir, and Blaug, Mark, and Associates

The Practice of Manpower Forecasting

San Francisco: Jossey-Bass Inc., Publishers, 1972.

This work is a collection of case studies which provide a detailed analysis of forecasting work in a number of countries which have had a fairly long record in the field. They include the United States, Canada, Britain, France, and Sweden in the developed world, and India, Thailand, and Nigeria in the underdeveloped world. The analyses cover a wide variety of forecasting methods. The book examines forecasts for the labor force as a whole in addition to those for single field, such as science, engineering, teaching, and medicine. Analyses of short-term and long-term forecasts are provided, and the methodology of each is explained.

The authors argue that manpower forecasts can play a vital part in educational planning and in determining where and how investment in education should be made. Recognizing that forecasting attempts so far have been either inconclusive or outright failures, they attempt to show in illustrative cases what went wrong and why. The book also provides an international overview which suggests distinct patterns and similarities in forecasting.

EMPLOYMENT

-- Higgins, Stephen A.

"The Supply and Demand for Education Doctorates"

Phi Delta Kappan, Vol. 53 (May, 1972), 588-91.

Much of the recent discussion regarding the overproduction of doctorates has centered on the sciences as well as several related academic disciplines, and suggests that supply will continue to exceed demand during the next few years. Higgins turns the discussion to the field of education and calls attention to the fact that Allan Cartter warned in 1965 about an overproduction of doctorates by the early 1970s, that faculty quality in higher education, as measured by percentage of faculty holding the doctorate, was increasing, and that the "flight from teaching" was an academic myth, and that we would soon be hard-pressed to absorb even one-half of the doctorates who had historically entered the faculty ranks in our colleges and universities. Cartter used the field of education as one future area of overproduction to illustrate his case and Higgins expands on Cartter's observations.

Higgins bases his observations on two surveys conducted by the U.S. Office of Education. The first was conducted in October, 1963, and gathered information on full- and part-time faculty by academic area and by highest degree held. The second was conducted by the USOE in the fall of 1967 and provided another reference point for projecting supply and demand ratios. The article includes much useful statistical information.

ENROLLMENT

-- Adams, Walter

"The Undergraduate Experience"

Change, Vol. 4 (November, 1972), 14.

Mr. Adams reports on research resulting from a continuing study based on U.S. Census Bureau data which indicates that one of the major problems facing higher education in the next decade will be that posed by the question of undergraduate open enrollment. While his report focuses on undergraduate concerns, in particular enrollment trends, it makes a useful contribution to the literature on graduate education, and the question of enrollments, in that the data collected in the study indicate among other things that we can look forward to a major rise in the numbers and proportions of undergraduates aspiring to graduate education accompanied by mounting concern with access to graduate and professional schools and with the "payoff" of graduate education. According to the author, not only may absolute numbers of students in graduate and

professional school increase sharply, but also the ratio of persons earning baccalaureates only. The rise in the college attendance rates of high school graduates is about to be replicated at a higher educational level. In his view this development could prove to be a major problem in the latter 1970's and 1980's because it would be largely unanticipated. In short, graduate study can be expected to become the majority experience for college graduates, just as college entrance became the majority experience for high school graduates several decades earlier.

-- Blandford, Barbara A., and Dutton, Diane

Survey of First-year Graduate and Postdoctoral Enrollment in Science and Engineering

Washington, D.C.: American Council on Education Higher Education Panel Report, No. 1, August 19, 1971.

This report is based on a survey conducted in July of 1971 in which institutions were asked: 1) to indicate new applications received through July 5, 1970 and actual first-year graduate and postdoctoral enrollment for that year; and 2) to estimate enrollments for 1971 indicating the number of new applications recieved as of July 5, 1971. The survey focused on first-year graduate enrollment and postdoctoral enrollment in subfields of science and engineering.

Among the conclusions reached by the authors are the following: 1) Those fields that have increased their program size or scope are most often the physical sciences and engineering. The reason most often given for these increases is a larger demand in the job market; 2) Reduction of program size or scope, increased tuition, lowering of financial aid, restrictive admissions, suspended applications to Ph.D. programs occur most often graduate school-wide and not within any specific field, and generally reflect an institutional reaction to the current supply and demand situation in the job market; 3) The medical sciences are an exception to this general rule. In the medical sciences fewer students are being enrolled because of the termination of NIH-supported Training Grants which provided stipend support; 4) Two changes that occur together most often are the increase in tuition costs and the more restrictive admissions policies (including, in some cases, quotas on graduate enrollment); and 5) Changes in institutional policies made during 1970 that would affect postdoctoral enrollment were few.

-- Blandford, Barbara A., and Trexler, Joan C.

Expected First-year Graduate Enrollment in Science and Engineering, Fall 1972

Washington, D.C.: American Council on Education Higher Education Panel Report, No. 10, August 11, 1972.

This report is based on a survey conducted in July of 1972 in which institutions were asked: 1) to indicate how many new applications they had received through July 5, 1971, and what the actual first-year graduate enrollment for that year had been; and 2) to estimate enrollments for 1972, indicating the number of new applications received as of July 5, 1972. The survey was limited to institutions granting doctorates in science of engineering fields.

The authors found that an overall increase of two percent in first-year science and engineering graduate enrollments was anticipated in the fall of 1972, but the projected trends differed according to type of institution and field. Public institutions reported an expected increase, whereas private institutions said they expected a substantial decrease. They also report that the "top twenty" institutions expected declines in enrollments in all major science and engineering fields while "developing" institutions reported that they expected enrollments to drop in physical sciences, social sciences, and engineering, and to rise in the other major categories. What the authors describe as the remainder or "other" institutions make up the bulk of the Ph.D. granting institutions and they reported that increases in all major categories except engineering were expected.

-- Committee on Institutional Cooperation

Inventory of CIC Graduate School Doctoral Programs, 1961-1970

Evanston, Illinois: Committee on Institutional Cooperation, 1971.

This inventory of programs leading to the Doctorate in Philosophy in the eleven universities comprising the Committee on Institutional Cooperation is a project sponsored by the graduate deans of these universities. All graduate schools were asked in the survey to prepare a list of Ph.D. programs offered at their institution. All doctoral programs granted through the Graduate School are included (Ph.D., Ed.D., D.M.A., etc.). Professional doctorates (M.D., D.D.S., D.V.M., D.P.H., etc.) are not included. The classification basically follows that of the U.S. Office of Education, but was revised in some instances in order to approximate as closely as possible existing institutional practice. The report provides data on: 1) the number of graduate faculty involved in each area; 2) the number of doctoral students enrolled; and 3) the total number of doctorates granted in the time span covered in the survey.

-- Moses, Lincoln E.

"The Response of Graduate Enrollment to Placement Opportunities"

Science, Vol. 177 (August 11, 1972), 494-497.

The author begins by noting that the American Institute of Physics has for years kept detailed records of graduate and undergraduate enrollments, degrees granted, and many other kinds of information. Because physics provides the longest period of adjustment and the most comprehensive data of any field, he uses it as a point of departure in a thorough discussion of enrollment trends and projections. Based upon the data presented, he argues that marked reduction in numbers of entrants to graduate study powerfully readjusts the size of the Ph.D. crop, and that perceiving the adverse economic prospects, many "fewer qualified students go into physics." He interprets the decline in numbers of undergraduate physics majors and the decline in the percentage of those going on to become graduate students as deriving from the perception of adverse placement opportunities.

Examining the thesis that there will be reductions in graduate enrollments for the Ph.D. in general as a result of the postulated oversupply of Ph.D.'s, he discusses several important questions raised by that thesis. Which students will elect not to enter Ph.D. programs--- the more capable or the less capable? To what extent will newly recognized societal problems call for new Ph.D. programs? Which schools will feel the reductions in numbers? What would be desirable responses to the impending cessation of growth and the probable absolute downturn in the size of Ph.D. programs on the national scale?

He concludes by observing that two things are striking about the projections of physics Ph.D.'s for 1975 and 1980: 1) the wealth of comprehensive data available, because of the efforts of the American Institute of Physics, and 2) the way in which those data lead to answers quite different from those obtained by examining data of a more agregated and less adequate nature (which he feels is the case in every discipline except physics). He argues that similar data collecting efforts must be conducted for other fields and suggests that such a task could be undertaken by the Office of Education or the Council of Graduate Schools.

-- National Science Foundation

"Changes in Graduate Programs in Science and Engineering, 1970-72 and 1972-74"

Washington, D.C.: National Science Foundation, Science Resources Studies Highlights, July 21, 1972 (NSF 72-311).

This report argues that the general expectation of a continuing large expansion in the number of graduate programs expressed a few years ago, particularly in the sciences, now appears unfounded. Available information now indicates that little expansion in graduate programs in science and engineering occurred in the past two years, and even less is expected in

the next two. These conclusions are made on the basis of data collected in a survey conducted for the Federal Government by the American Council on Education through its Higher Education Panel designed to determine the dynamics of growth and decline of graduate programs in higher education. The report examines quantitative changes in graduate programs both at the doctoral and masters levels.

COSTS AND FINANCING

FEDERAL SUPPORT POLICIES

-- McGinnis, Robert

Federal Funding and Graduate Education in Bioscience

Washington, D.C., The National Research Council, 1972. (Mimeographed)

This study was supported by the National Institute of General Medical Science and conducted by the Office of Scientific Personnel of the National Research Council. The purpose of the study was to study as quantitatively and analytically as possible the relationship between the number of doctorates awarded in biomedical fields by U.S. universities and the level of Federal support. The period considered was from 1947 to 1969. The author does not attempt to base specific policy recommendations on the results of the study nor to apply them to specific educational programs.

Specifically, the study represents an enquiry into what determines the size of our stock of scientists, or at least its "home-grown" segment. The research was also designed to attempt to determine the extent to which our "doctoral hatcheries, the nation's universities," are sensitive to and dependent on Federal funds for their production of scientists. Equally important, in the eyes of the author, was the question of whether our graduate schools are homogeneous in the doctoral scientists that they produce, or whether systematic differences can by found among these products in their subsequent careers. Twenty-one major findings resulting from the study are presented.

STUDENTS AND STIPENDS

-- Delehanty, George

"The Burden of Graduate Student Debt"

Paper prepared for The Committee on Institutional Cooperation, 1972. (Mimeographed).

This paper is a report on the results of a survey of graduate student indebtedness at four midwestern universities (Northwestern, Minnesota, Iowa, and Chio State). Research was undertaken in 1970-71 with the assistance of the CIC (the Big Ten Universities plus the University of Chicago).

The following represents a sample of the conclusions reached: 1) Among the universities sampled, about one-half of the graduate students report educational debt; 2) The median amount owed is $1,800, with males owing somewhat more than females; 3) For a number of reasons, median debt amounts do not vary greatly with age, years of study, or field; and 4) A similarity of debt amounts exists among the public and private institutions in the sample.

SUPPORT AND FUNDING

-- Blandford, Barbara A., and Dutton, Diane

Research Support for Science Faculty

Washington, D.C.: American Council on Education Higher Education Panel Report, No. 2, November 4, 1971.

This report describes the results of the second survey of the Higher Education Panel, conducted during September and October of 1971. The survey concerned to the split of research funds between young and senior faculty at institutions granting Ph.D.s in science and engineering. While the report provides numerous tables and ample figures compiled as a result of the survey, there is little in the way of discussion of the meaning of data collected. No specific findings or conclusions are presented for the reader.

RECOMMENDATIONS

PURPOSES AND GOALS

-- Committee on Professional Training---the American Chemical Society

"Doctoral Education in Chemistry: Facing the 1970's"

Chemical and Engineering News, Vol. 50 (August 14, 1972), 35-39.

This Report of the Committee on Professional Training of the American Chemical Society focuses on the changing circumstances in graduate education and their implications for chemistry. The Report examines directly the problems of capacity (supply and demand), student admissions and quality, the nature and purpose of the Ph.D. in Chemistry, the hallmarks of a good program, and quality standards and production controls.

The committee reaches the decision that a number of informal approaches can be of value in maintaining and upgrading standards for Ph.D. education in chemistry, but that there are limitations to what can be accomplished on a more formal basis. In the committee's view, the rapid growth of graduate programs in the 1960's made ample facilities available and attracted many very able young people into graduate teaching. It is argued that what graduate schools can accomplish is now determined primarily by the quality of students which they can attract, and that staffs and faculties (while recognizing the realities of supply and demand during the 1970's) must remember that quality rather than quantity of research is what is important.

-- Hungate, Thad L.

Management in Higher Education

New York: Columbia University, Teachers College Press, 1964

While Hungate does not focus his attention directly on graduate education per se, in Appendix 5-A he presents a thorough overview of the problems and concerns relating to graduate education in the middle sixties. And although the book is eight years old, the discussion under "Research and Graduate Education" warrants continued attention by students of graduate education even today. His treatment includes discussion of: 1) research and scholarship; 2) the impact of research on finance; 3) the relation of teaching and research; 4) the implication of external controls on research; and 5) problems of the graduate school. The discussion is actually a presentation of the views of those considered to be the most competent scholars of graduate education during the sixties.

-- Seitz, Frederick

"Reflections on the Relationships Between Science and Technology and Society"

Science Policy Review, Vol. 5 (Two/1972), 3-10.

This article results of observations made by Dr. Seitz, President of Rockefeller University, in a speech given at Battelle's Science Policy Colloquim in May of 1972. It includes some thoughtful comments on the public's historically ambivalent attitude toward pure science and its current misgivings about the benefits of technology, the revolutionary boiling up and simmering down of the intellectual community, and the relaxation in moral standards.

He examines, among other topics, the present status of science, the present status of technology, the current social ferment, the uncertainty in professional societies, the break of traditional moral codes, the adjustment of industry, public expectations, and pure science. A central part of his discussion focuses on what he refers to as four areas of primary importance for the advancement of science and technology in our society; namely, the academic institutions, industrial research laboratories, free-standing research institutes both commercial and nonprofit, and the Federal research establishemnts.

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